

ABM 30 mm x 173

# 30 mm Air Burst Munition ABM

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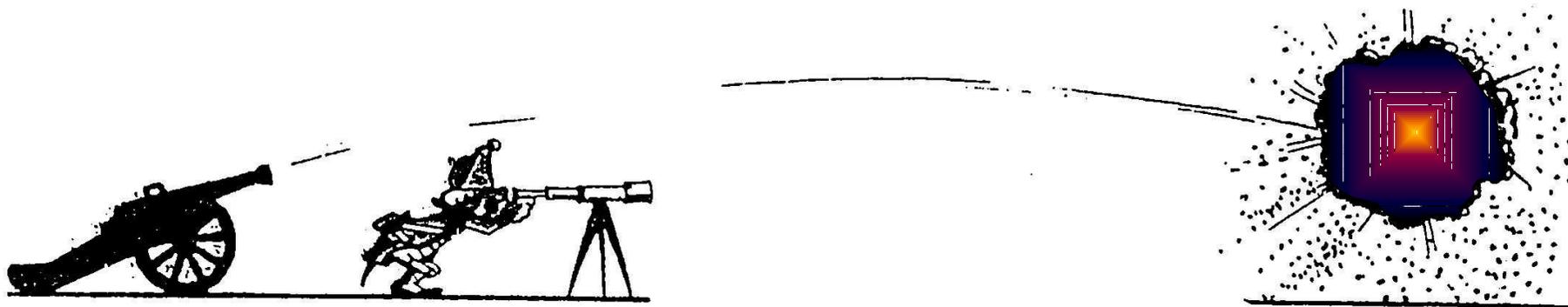
**NDIA 35th Annual Gun & Ammunition Symposium  
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# ABM ... What's that?

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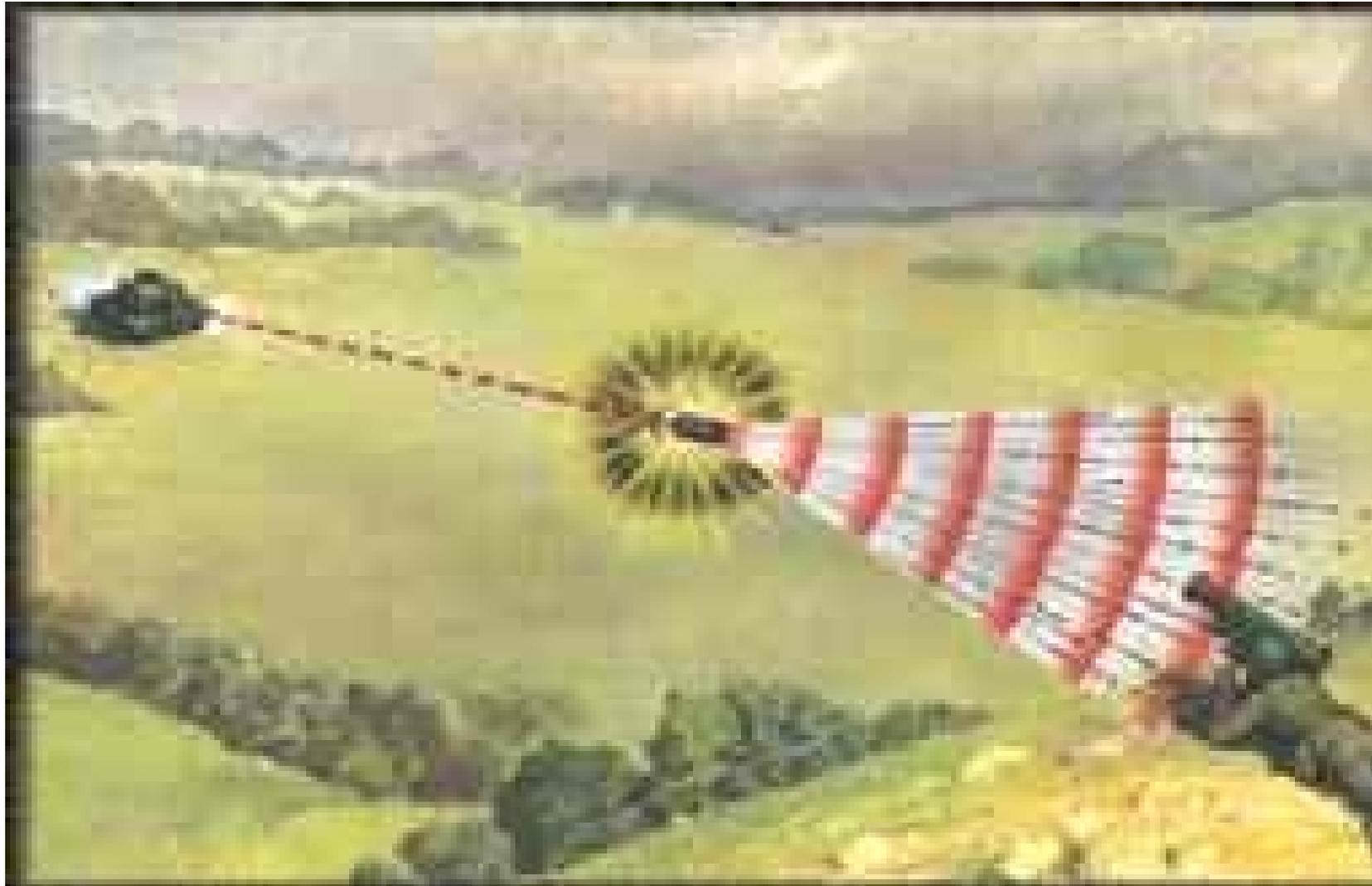
It is a munition which bursts in the air  
... in a controlled manner!

Dawn of the ABM: 1784



# Air Bursting Munition

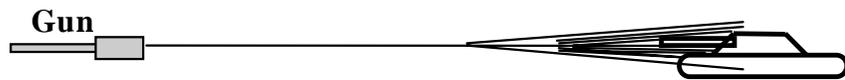
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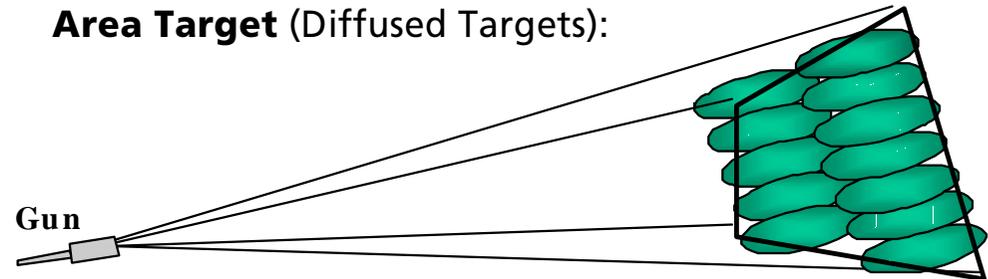
# ABM Operation Modes

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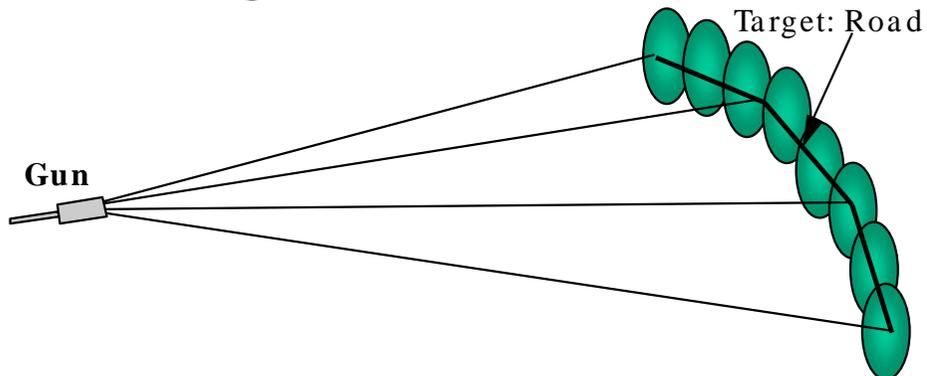
**Point Target** (ATGW-Bunker, Prone & Covered Troops, IFV, Helicopter, etc.):



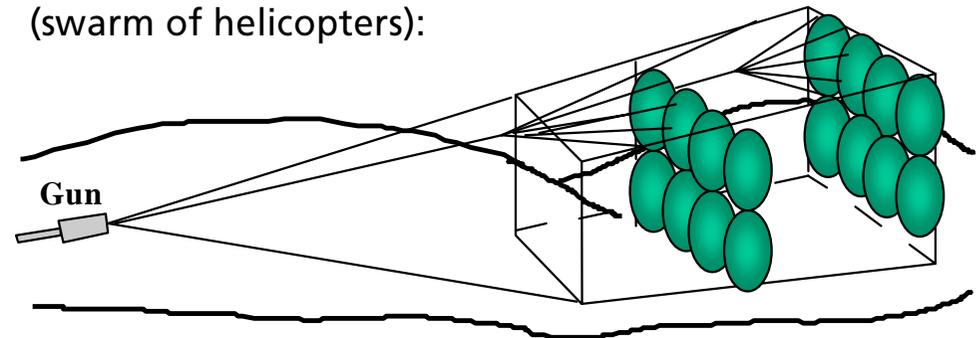
**Area Target** (Diffused Targets):



**Linear Target** (road with vehicles):



**Pre-Determined Air Space** (swarm of helicopters):



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# Universal Ammunition Mission Roles - Targets

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## Mission Roles

- Dissuasion To Incapacitation

## Targets

- Jeeps To Trucks
- APC/IFV To Main Battle Tank
- Inflatables To Speed Boats
- Dismounted Troops To Bunker w/ ATGM
- Helicopters To Aerial Vehicles

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# Gun Ammunition Implementation Possibilities

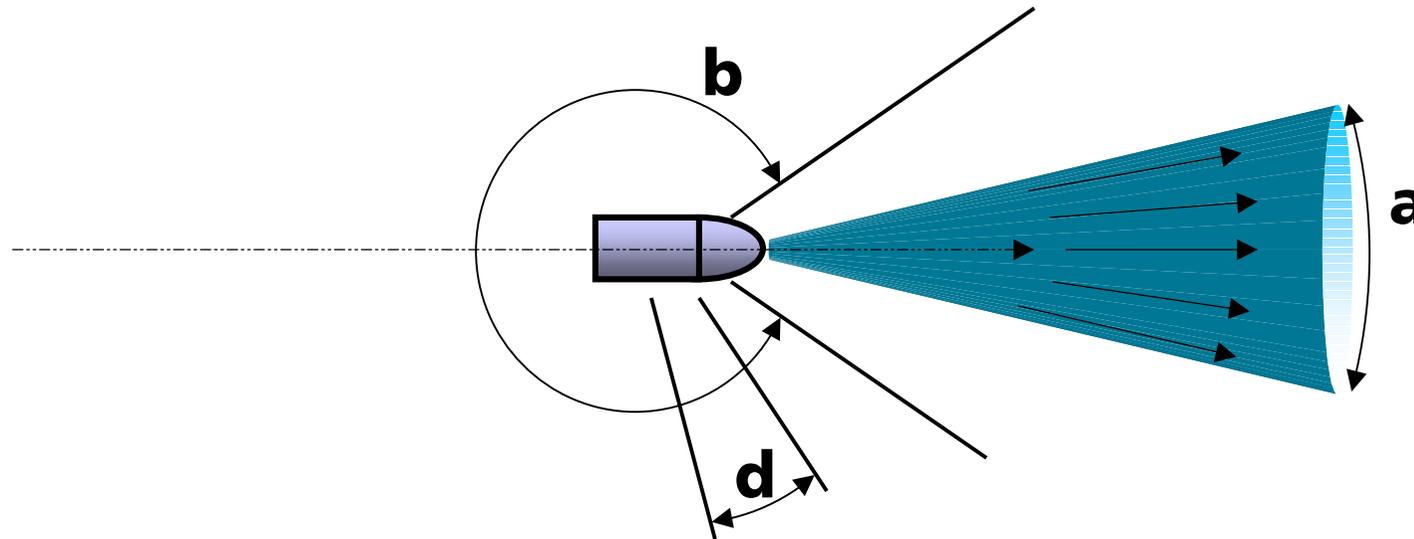
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- ▶ Caliber of Gun: 25 to 155 mm
- ▶ Firing Rate of Gun: up to 5000 rd/min
- ▶ Muzzle Velocity of Projectile: sub- to hyper-sonic
- ▶ Type of Shell: focused subprojectile payload  
to blast fragmentation warhead
- ▶ Application: e.g. armament for vehicles,  
ships, helicopters, aircraft

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# Design of the Payload: Effective Fragmentation Area

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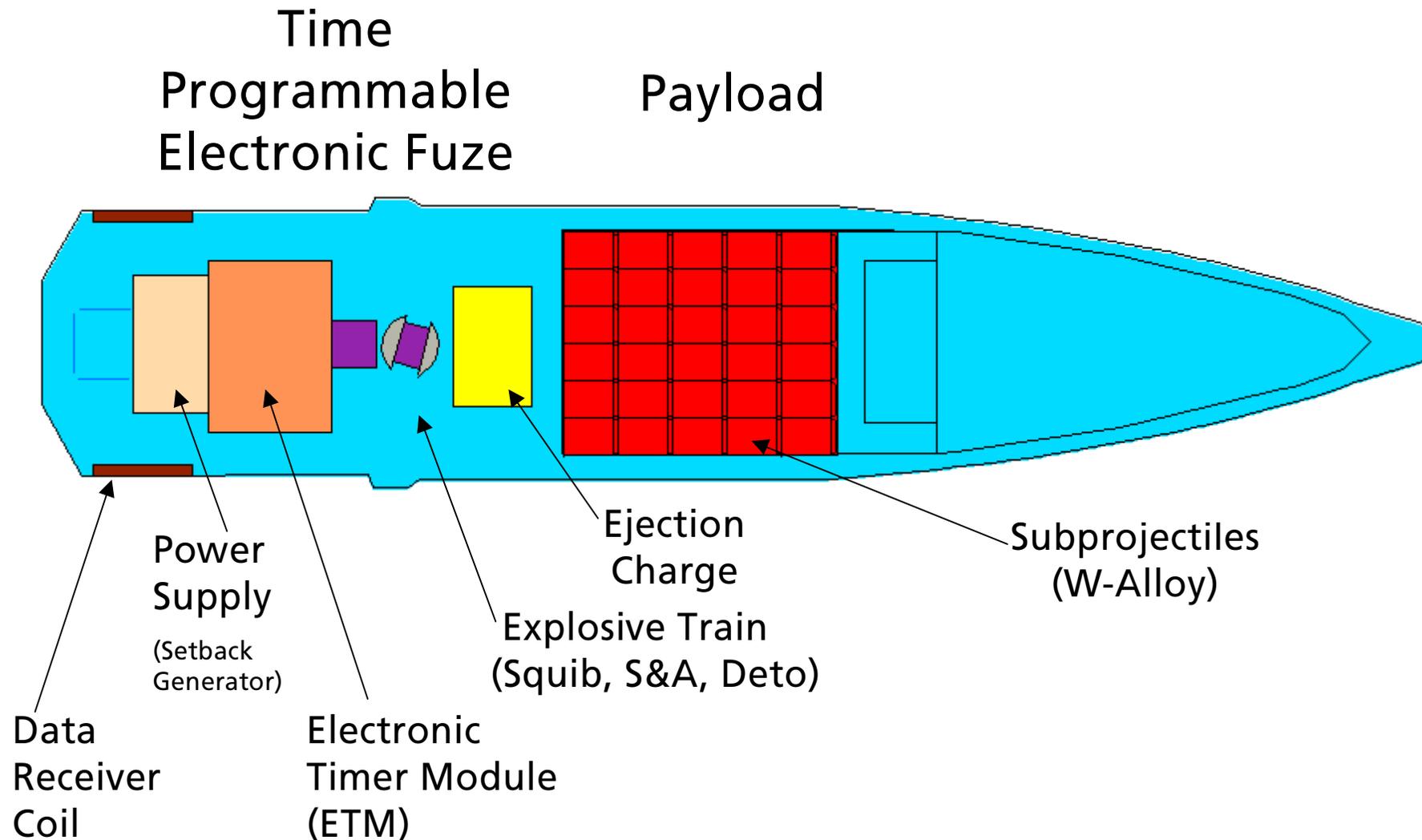
## Effective Fragmentation Areas:

- a) axially focused cone (angle  $< 30^\circ$ ; e.g. 30/35 mm ABM w/subprojectiles)
- b) diffused area (angle  $> 180^\circ$ )
- c) combination of a & b
- d) asymmetrically focused cone (angle  $< 30^\circ$ ) for larger caliber

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# Projectile Concept Outline

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# 30 mm ABM Fuze Module (Ahead Technology)

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Ignition System

Electronic Timer Module

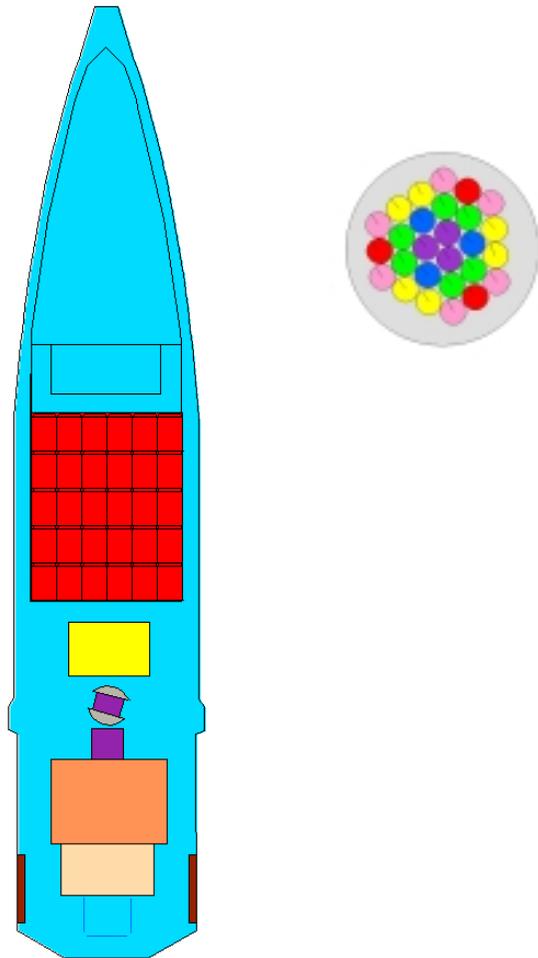
Set-Back Generator



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# Projectile & Fuze Data

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## Projectile

- Projectile Mass 360 g
- Muzzle Velocity 1080 m/s
- Payload Mass (heavy metal) 206 g
- Subprojectile Spin Stabilized 135
- Subprojectile Mass 1.5 g

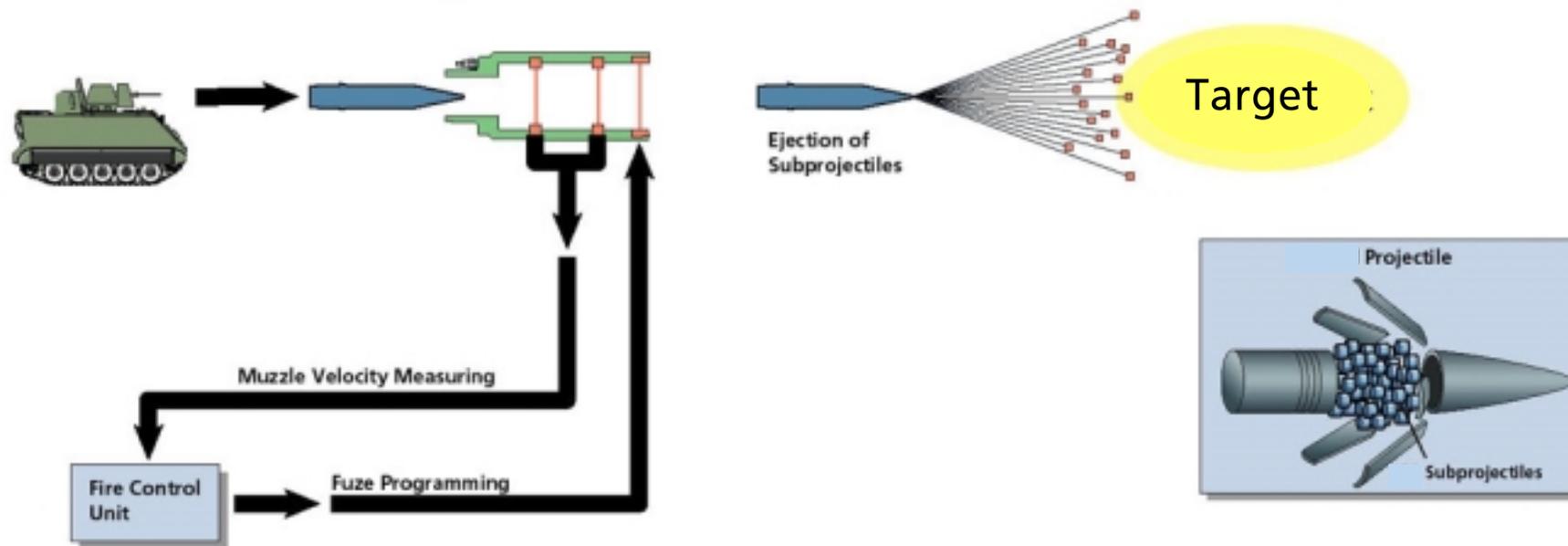
## Fuze

- Time Programmable at Gun Muzzle
- Muzzle Safety Time 64 ms
- Time Resolution 2 ms
- Self Destruct Range ~ 4 km

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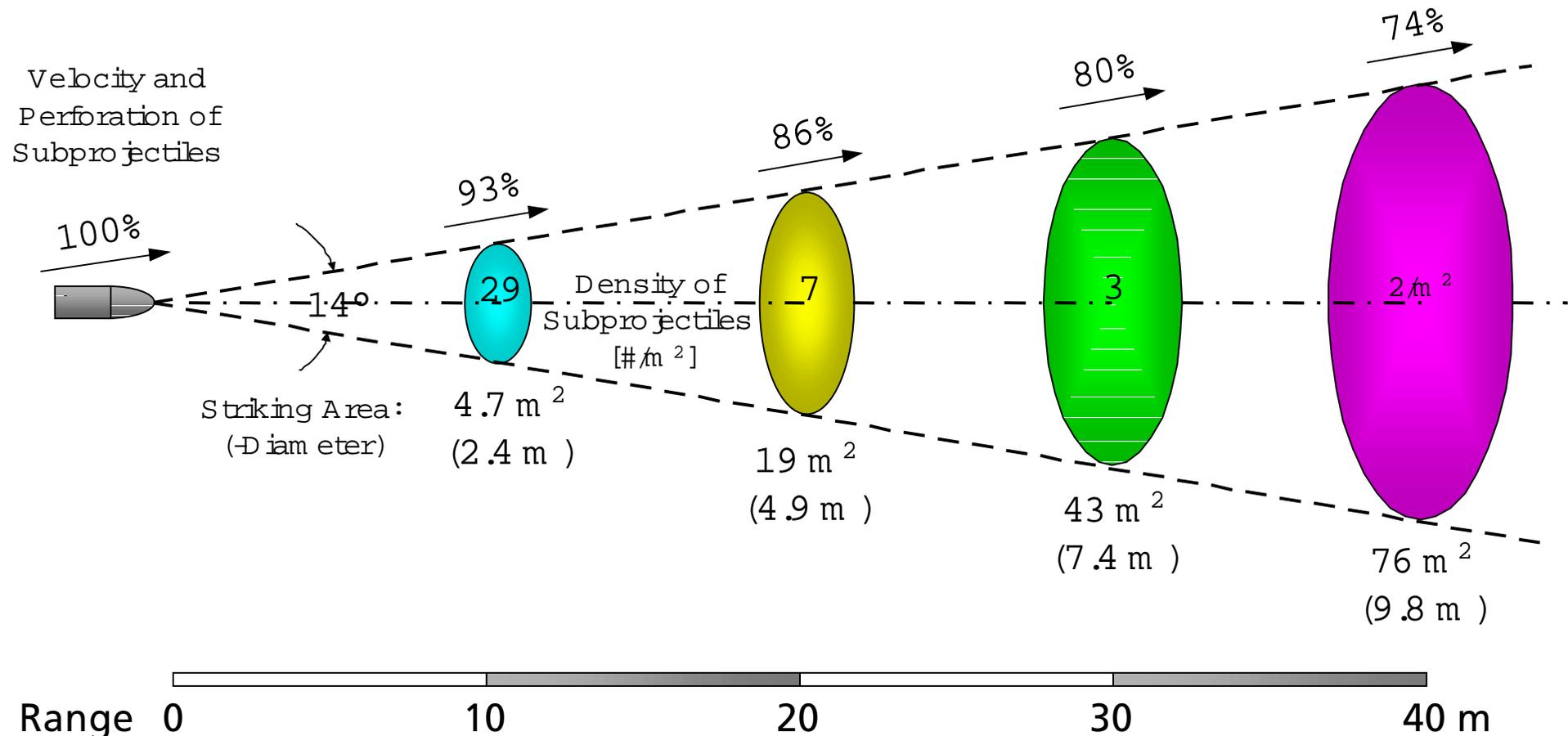
# Infantry Fighting Vehicle w/ 30 mm ABM System

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# Payload Dynamic Parameters

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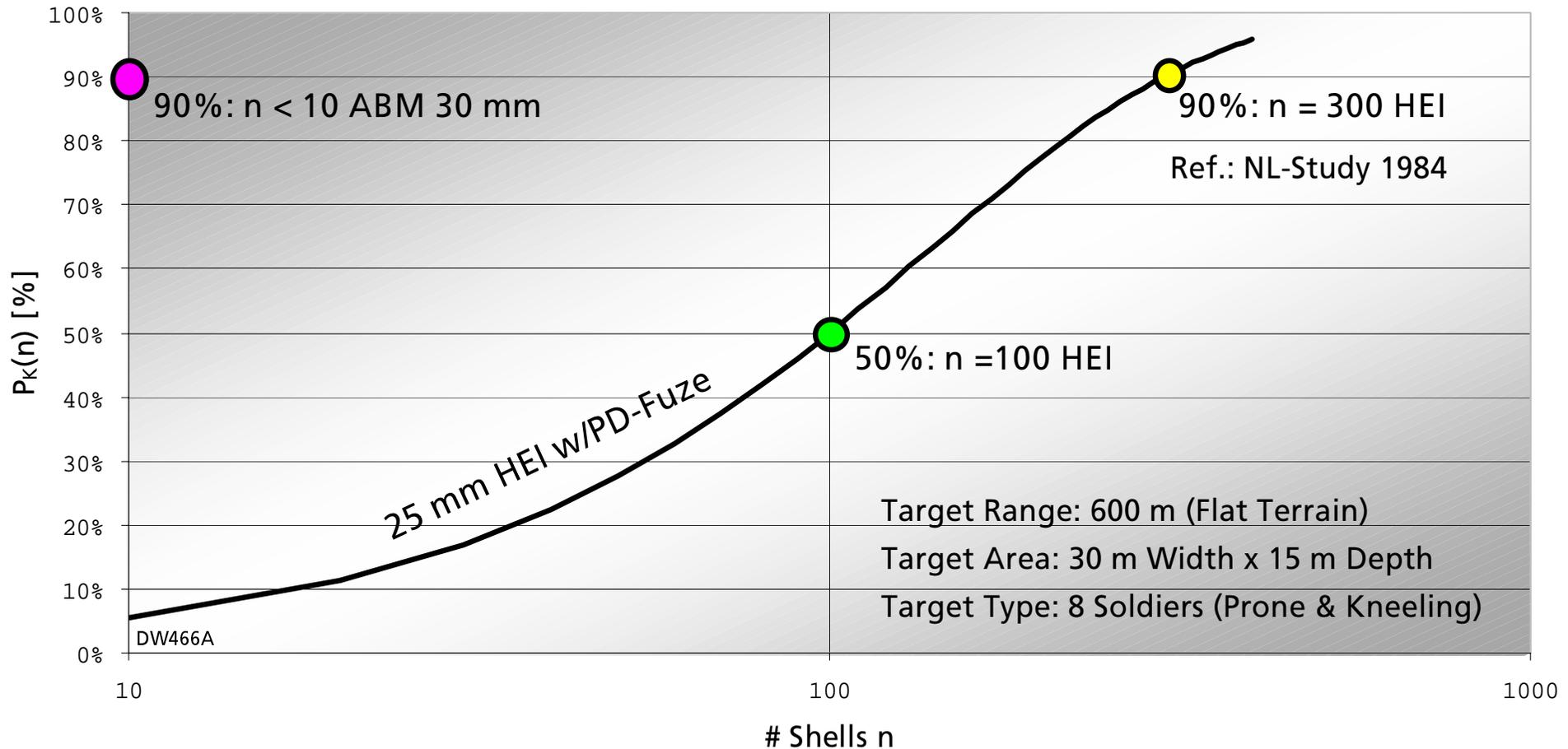


**Note:** The opening angle of the subprojectile cone (12° @ 100 m, 14° @ 1 km range for a twist angle @ muzzle of 8.5°) increases with greater range in proportion to the corresponding spin to velocity ratio of the projectile.

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# ABM 30 mm vs. HEI 25 mm: Incapacitation of Diffused Target

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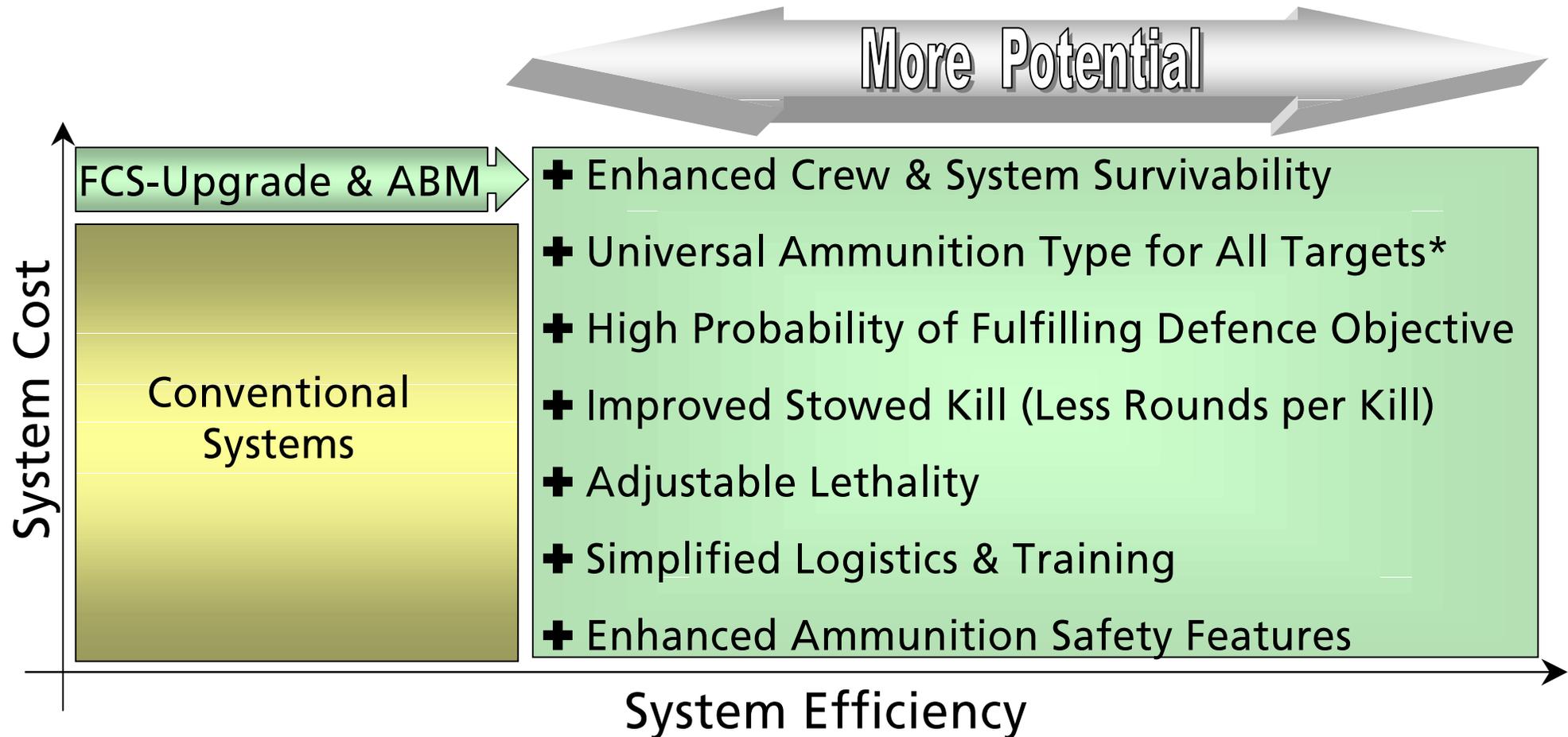
Incapacitation Probability  $P_K(n)$  as a function of the number of shellbursts  $n$  inside the target area

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# ABM - New Perspectives

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## Minimum Investment for Maximum Potential



\* In certain anti-armour scenarios APFSDS-T and FAPDS-T ammo types may be more cost effective!

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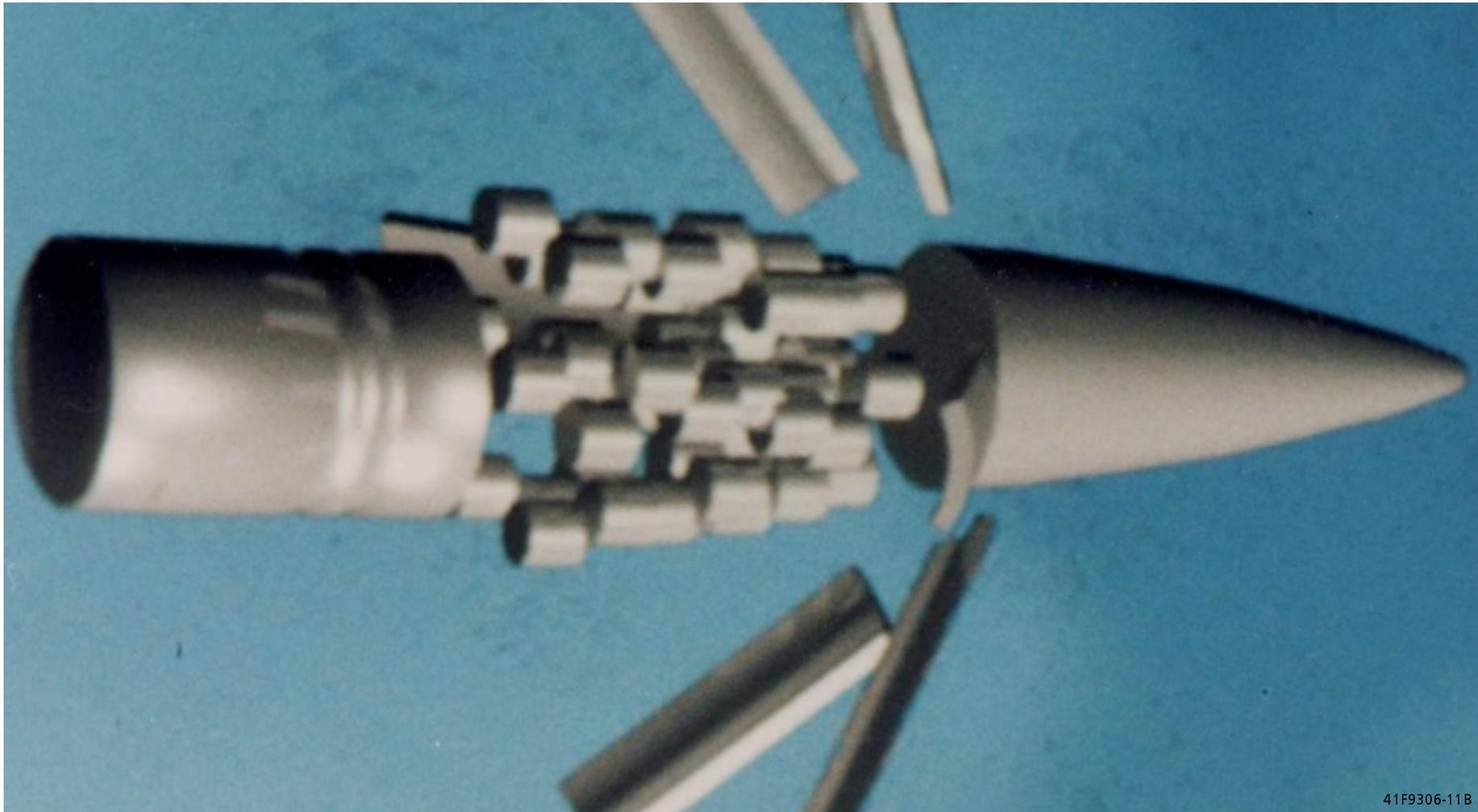
# OCP Messages concerning ABM

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- ✓ Proven Feasibility of Concept = 35 mm Ahead technology
- ✓ Proven Maturity of Technology = NATO qualified (35 mm)
- ✓ Proven Lethality = APG tests Oct./1998 (35 mm)  
= EZO tests 01/Dec./1999 (30 mm)
- ✓ Proven Availability of Product = ordered by Canada & others (35 mm)
- ✓ Ready for Cooperation = 30 mm x 173, 40 mm x 53 HV (AGL)

# The Ahead Concept is Ready for the ABM Mission

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